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Case No. 10225/65 (A14)

Conf. No. 8330

Appellants submit this Appeal Brief in response to the final rejection of the pending claims mailed on December 18, 2007. Appellants filed a Notice of Appeal on March 10, 2008. This brief is timely filed within two months of the filing of the Notice of Appeal.

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This is an appeal from the final rejection of all pending claims in the Final Office Action mailed December 18, 2007. This brief is timely filed within two months of the March 10, 2008 filing of the Notice of Appeal.

I. Real Party in Interest

The real party in interest is the assignee of this application, Altair Nanomaterials, Inc. of Reno, Nevada.

II. Related Appeals and Interferences

There are no related appeals or interferences that would affect, be affected by, or have a bearing upon, the Board's decision in the present appeal.

III. Status of Claims

Claims 1-20 are pending in this application with claims 15-20 being withdrawn in view of a Final requirement of restriction. Claims 1-14 are rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 1-14 of prior U.S. Patent No. 6,689,716. Appellants appeal the rejection of claims 1-14. A copy of the current claims is provided in Section VIII.

IV. Status of Amendments

No amendments have been made to the claims.

V. Summary of Claimed Subject Matter

The invention is defined by the claims of which there is a single independent claim, claim 1, and dependent claims, 2-14. A general process flow sheet can be understood by reviewing Fig. 1. The present invention relates to a process for manufacturing microporous structures (Abstract) or crystalline structures (para. [0038])

that can be used in a variety of applications (e.g., non-catalytic application) such as forming the substrate for coatings of metal oxides, solid solutions, or for creation of multilayered crystalline materials (para. [0039]).

The process requires the following steps. First, an aqueous solution of a metal salt and a chemical control agent are mixed to form an intermediate solution (paras. [0021] and [0022] and Fig. 1, particularly step 10). The metal salt can be a variety of metal salts where the metal can include but is not limited to Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Mn, Al, Sn, Sb, Pb, Bi, and mixtures thereof (para. [0021]). The chemical control agent can include a variety of salts such as chloride salts, carbonate salts, fluoride salts, sulfate salts, silicate salts, borate salts and phosphate salts of sodium, potassium, lithium, aluminum, tin, and zinc, as well as phosphoric acid (para. [0022]).

The intermediate solution is evaporated to form an intermediate product (paras. [0023] – [0025] and Fig. 1, particularly step 20). The evaporation is caused to occur under particular conditions (*Id.*). For example, the evaporation can be conducted at a temperature between about 100° and 400° and by spraying (see para. [0024]).

The intermediate product is mixed with a binder to form a mixture (paras. [0026] and [0027] and Fig. 1, particularly step 30). The binder may include an inorganic binder, an organic binder, and mixtures thereof (para. [0027]).

The mixture is dried to form a dried mixture (para. [0029] and Fig. 1, particularly step 40). The dried mixture is pressed into a desired shape (para. [0030] and Fig. 1, particularly step 50). The pressed material is crystallized by raising the temperature to

between about 500° C. to about 1300° C. for a period of time from about 2 to about 24 h and thereafter by cooling to room temperature (paras. [0032] and [0033] and Fig. 1, particularly step 60). The heat treated product from above is then washed (para. [0034] and [0035] and Fig. 1, particularly step 70).

VI. Grounds of Rejection to be Reviewed on Appeal

The sole issue on appeal is whether the final rejection of the claims 1-14 under 35 U.S.C. § 101 as claiming the same invention as that of claims 1-14 of prior U.S. Patent No. 6,689,716.

VII. Argument

Appellants request that the Board reverse the final rejection of claims 1-14 under 35 U.S.C. § 101 because the current claims do not claim the **same** invention as that of claims 1-14 of prior U.S. Patent No. 6,689,716.

A. Claims 1-14 do not claim the same invention as claims 1-14 of US 6,689,716

As seen in Section VIII, below, claims 1-14 of the subject application are directed to a “process for the manufacture of structures comprising” In contrast, claims 1-14 of US 6,689,716 are directed to a “process for the manufacture of **catalytic** structures”. Not all structures made according to the process of claim 1 of the subject application are catalytic structures. It follows therefore, that the process claims of the subject application are not claiming the same process as in US 6,689,716.

According to MPEP 804, the term “same invention” means identical subject matter. A reliable test is “whether a claim in the application could be literally infringed

without literally infringing a corresponding claim in the patent" (See MPEP 804). The MPEP explains that an invention defined by a claim reciting a compound having a "halogen" substituent is not identical to or substantively the same as a claimed reciting the same compound except having a "chlorine" substituent in place of the halogen because "halogen" is broader than "chlorine". The current claims are analogous to the example provided in the MPEP. Here, the claims of the current application are directed to structures; whereas, the claims of US 6,689,716 are directed to catalytic structures. Put another way, the process for manufacturing structures does not necessarily literally infringe the process for manufacturing catalytic structures. Because the current claims dominate, a statutory double patenting rejection is not proper.

The Examiner argues that there are no such clear "non-catalytic" examples, which would be analogous to the halogen example above. There is no factual basis for this argument and, in fact, this argument is not correct. For example, the process of claim 1 can be used to form a non-catalytic titanium dioxide structure to be used as a substrate for lanthanum according to para. [0039] of the present application so that the resulting product could be used to bind with phosphate to treat, for example, hyperphosphatemia or for treating swimming pools. Such use is clearly non-catalytic.

As another example, the process of claim 1 can be used to make a non-catalytic stabilized zirconia, which can then be used in the manufacture of thermal barrier coatings and solid oxide fuel cells, each of which are non-catalytic.

As yet another example, the process of claim 1 can be used to make a non-catalytic lithium titanate, which can then be used in the manufacture of lithium ion batteries, which is non-catalytic.

The above examples, which are not exhaustive, demonstrate that, contrary to the Examiner's assertion, there are clear "non-catalytic" examples. Accordingly, the provisions of MPEP 804 apply and the rejection is improper.

B. The Argument that "claims 1-14 would be inherently catalytic in view of claims 2-14 and the specification, which defines them" does not make sense

Appellants do not understand the meaning of this argument. If the Examiner is arguing that the process limitations of the dependent claims 2-14 of US 6,689,716 necessarily mean that the process of claim 1 of the subject application would inherently produce catalytic structures, Appellants cannot agree. As pointed out above, Appellant has provided several examples, of non-catalytic structures produced by the process of claim 1. Furthermore, two of the examples, the titanium dioxide and the stabilized zirconia can each be produced according to the process of claim 3 of the subject application. Thus, if the Examiner contends that claim 3 of US 6,689,716 inherently produces a catalytic structure, the above examples demonstrate that the Examiner is incorrect in his contention. Therefore, the rejection should be withdrawn.

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C. Conclusion

In view of the above remarks, Appellants submit that the claimed invention is patentable and therefore request the reversal of the rejection of Claims 1-14.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "G. Peter Nichols", written over a horizontal line.

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VIII. Claims Appendix

1. (Original) A process for the manufacture of structures comprising:
 - a. mixing an aqueous solution of a metal salt and a chemical control agent to form an intermediate solution;
 - b. evaporating the intermediate solution to form an intermediate product wherein the evaporating is conducted in a controlled temperature process at a temperature higher than the boiling point of the solution but lower than the temperature where significant crystal growth occurs;
 - c. mixing the intermediate product with a binder to form a mixture;
 - d. drying the mixture to form a dried mixture;
 - e. pressing the dried mixture into a desired shape;
 - f. crystallizing by raising the temperature to a range between about 500° C. to about 1300° C. for a period of time from about 2 to about 24 h and thereafter by cooling to room temperature; and,
 - g. washing the product of step f.
2. (Original) The process of claim 1 wherein the metal forming the metal salt can be selected from the group consisting of Ti, Zr, Hf, V, Nb, Ta, Cr, Mo, W, Mn, Al, Sn, Sb, Pb, Bi, and mixtures thereof.
3. (Original) The process of claim 1 wherein the metal salt is selected from the group consisting of titanium oxychloride or zirconium oxychloride.
4. (Original) The process of claim 1 wherein the metal salt is titanium oxychloride and wherein during the crystallizing step the temperature is raised to a range between about 800° C to about 1200°C.

5. (Original) The process of claim 1 wherein the metal salt is zirconium oxychloride and wherein during the crystallizing step the temperature is raised to a range between about 1000° C to about 1300°C.
6. (Original) The process of claim 1 wherein the chemical control agent is selected from the group consisting of chloride salts, carbonate salts, fluoride salts, sulfate salts, silicate salts, borate salts and phosphate salts of sodium, potassium, lithium, aluminum, tin, and zinc and phosphoric acid.
7. (Original) The process of claim 1 wherein the evaporation step is conducted at a temperature between about 100° C. and about 400° C.
8. (Original) The process of claim 1 wherein the evaporating is conducted by spraying.
9. (Original) The process of claim 8 wherein the intermediate product comprises a plurality of hollow spheres and parts of spheres.
10. (Original) The process of claim 9 wherein the diameter of the spheres is between about 1 μm and about 100 μm .
11. (Original) The process of claim 9 wherein the thickness of the sphere is between about 30 nm and about 5000 nm.
12. (Original) The process of claim 1 wherein the binder is selected from the group consisting of inorganic binders, organic binders, and mixtures thereof.

13. (Original) The process of claim 1 wherein the washing is conducted by successively immersing the product in water, heating it to boiling, and keeping it at the boiling point for a period of time from about 5 min to 2 h.
14. (Original) The process of claim 1 wherein a surface treatment additive is mixed with the intermediate product and binder.
15. (Withdrawn) A titanium dioxide structure made according to the process of claim 1 characterized by a porosity in the range of about 30% to about 70% and a thermal stability such that less than 5% dimensional change occurs upon holding the structure at 1100° C. in an oxidizing atmosphere for 8 h.
16. (Withdrawn) The structure of claim 15 wherein the structure comprises needle-shaped particles that are strongly bound together.
17. (Withdrawn) A structure made according to the process of claim 1 wherein the structure has a porosity in the range of about 30% to about 70%.
18. (Withdrawn) The structure of claim 17 wherein the structure has a thermal stability such that less than 5% dimensional change occurs upon holding the structure at 1100° C. in an oxidizing atmosphere for 8 h.
19. (Withdrawn) The structure of claim 17 comprising a plurality of individual particles forming the structure wherein the particles have a size in a longitudinal direction from about 0.1 to about 50 micron.
20. (Withdrawn) The structure of claim 19 wherein the particles have a width to length ratio from about 1:1 to about 1:20.

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IX. Evidence Appendix

N/A

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X. Related Proceedings Appendix

N/A